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References

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Natowicz MR, Alper JK, Alper JS (1992) Genetic discrimination and the law. Am J Hum Genet 50:465–475

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Am. J. Hum. Genet. 51:897, 1992

Reply to Natowicz et al.

To the Editor:

On several occasions the Equal Employment Opportunity Commission (EEOC) has specifically refused to interpret the Americans with Disabilities Act (ADA) as protecting individuals from genetic discrimination in employment if the affected individuals have not yet manifested symptoms of genetic disease. There is a possibility that the EEOC will change its position or that Congress or the courts will require the EEOC to do so. We would greatly welcome such a development. In our editorial, we were simply cautioning readers that, at the present time, it is an overstatement to say flatly that the ADA prohibits genetic discrimination in employment. Affected individuals, their families, and their genetic-services providers should be aware that the state of the law is not clear.

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Genetic Distinctions Are Not Necessarily Examples of Genetic Discrimination

To the Editor:

The comments of Natowicz et al. (1992), on what they allege to be "genetic discrimination," may have ominous consequences for public health and safety if some of the practices to which they object should be banned, as they urge. In their definition and application of the term "genetic discrimination" they assign a pejorative connotation to what may be, in *some* circumstances, legitimate social policy.

Among other examples, they discuss the possibility that sickle cell trait predisposes to blacking out or other sudden crises, at low oxygen pressure. Natowicz et al. imply that such carriers should be allowed to be high-altitude pilots because "at present *most* clinicians believe that heterozygosity for sickle cell disease is not associated with any adverse effects, . . . [and regarding] abnormalities . . . reported . . . the association *may* be coincidental . . . *except possibly for abnormalities arising in certain physiologically stressful environments*" (emphasis added) (p. 467).

The particular risks associated with sickle-cell-carrier trait are so inextricably mixed, in the public and even in the scientific mind, with race and ethnic background and with conceptions or misconceptions about ethnic or racial prejudice, that it would be best here to assume, optimistically, that Natowicz et al. are correct in their implicit assurances, however they may enfeeble their argument by the qualifications to which I've given emphasis in the above quotation. So consider, rather, an allele equally distributed in *all* subgroups of the population, which, while associated

with normal phenotype in normal circumstances, is "generally agreed" to be a high-risk factor for blackouts at pressures likely or even possibly encountered in a pilots' cabin. This is hypothetical, of course, but then Natowicz et al. cite extensively their own hypothetical examples. The logic of the argument Natowicz et al. make implies that even *if* individuals were known to be at high risk because of a *genetic predisposition* for a condition leading to collapse, and if a major public health catastrophe were to result from this exposure, they should be allowed such employment, because barring such carriers of a gene would be "genetic discrimination" and ipso facto unfair. I would argue that while such a policy would fit their definition of "genetic discrimination," it should be better classified as a legitimate "genetic distinction" of risk and should be excluded from the pejorative connotations of "discrimination." For it would be social idiocy to allow individuals with such a hypothetical trait to work in such a position.

This example is particularly forceful because it pertains not just to the safety of affected individuals themselves but to the broader general public who may be, unknowingly, at risk of disaster because of doctrinaire ideological concerns of those objecting to what they choose to term "discrimination." There are numerous other hypothetical examples one could cite, such as, say, a gene predisposing to blackouts in circumstances likely to be encountered by a railway engineer or a bus driver. (Whether such a trait is reliably remediable by therapy is another matter. Suppose it isn't?) If a risk factor has a significant association with a risk of catastrophe, then, irrespective of whether this factor is of genetic origin exclusively, of environmental origin exclusively, or of mixed origin, such a factor should be legitimately and, of course, intelligently considered in employment decisions. Seizure disorders constitute another obvious possible hazard. Each instance must be decided on a case-by-case, disorder-by-disorder, and hazard-by-hazard basis. But one should not preclude *any and all* consideration of genetic factors as Natowicz et al. urge in seeking an absolute ban on social genetic distinctions.

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Reply to Hook: Genetic Discrimination and Public Safety

To the Editor:

The issue of fairness in discrimination—and, in particular, in genetic discrimination—is an interesting and important one. However, Hook, in his letter, misrepresents our position concerning this issue (Hook 1992). In no section of our previous article do we state or imply that there are no situations in which differentiation between persons with specific genotypes may be appropriate (Natowicz et al. 1992). In fact, we agree with Hook that an employer could legally exclude an individual who has a genotype that is associated with significant risk for a medical condition that would in turn expose others to significant health and safety risks. The pilot, in his hypothetical example, who is at risk for blackouts should not be employed as a pilot by an airline. In our example of the Air Force pilot who was a heterozygote for sickle cell disease, we emphasized the fact that there is little evidence that the pilot would suffer any adverse affects due to his genotype, even at high altitudes.

The Americans with Disabilities Act (ADA), the U.S. Department of Justice and Equal Employment Opportunity Commission regulations implementing the act, as well as their interpretation of the regulations, address this problem directly. Section 103(b) of the ADA states that the refusal to hire an individual is permissible if the individual poses "a direct threat to the health and safety of other individuals." The clearest discussion of "direct threat" is given in the interpretation of the regulations implementing Title II of the ADA. According to this interpretation, the determination that a person poses a direct threat "must be based on an individualized assessment, based on reasonable